Introduction to Sap-Sucking Insects, Gall Formers, and Mites

Honeydew, spittle masses, growth deformities, or dried out foliage

Sap-sucking insects feed on the sugary sap produced in foliage and transported in the soft phloem tissue beneath the bark. Some insects' feeding affects plant growth hormones, causing distinctive foliage or shoot deformities called galls. Gall formers feed protected within the gall. They may suck sap, as do gall-forming adelgids, or pierce and scrape the surface, as do some gall-forming midges. Mites (Acarina) are tiny arthropods that are more closely related to spiders and ticks than to insects. The class Acari contains 45,000 described species, but this is possibly only a portion of the total number of species yet to be described. Spider mites puncture individual cell walls on the outside of foliage and suck out the contents. This leads to a characteristic mottling of the foliage.

There are other types of mites that will be seen and noticed in a forested setting, but most are quite inconspicuous. One group of mites that may catch the observer's eye is the mites that are found associated with bark beetles. Opening up a bark beetle gallery or looking at an individual bark beetle may reveal the presence of mites. These bark beetle associates fulfill a wide array of functions, including being predators of bark beetle eggs and larvae, grazers of associated fungi, and even predators of other mites. Because mites are wingless, they must hitchhike to new bark beetle galleries on their bark beetle hosts. This pattern of movement is referred to as phoresy. These mites are an integral part of the bark beetle system.

General Features—

- Hosts and symptoms of sap feeding insects, gall formers, and mites are described in table 1 (see figs. 1-4).
- Sap-sucking insects like aphids and scales feed on foliage, twigs, branches, and, occasionally, on the trunks of trees. These insects often produce large amounts of sweet, sticky honeydew that can sometimes be seen as a fine mist coming from the trees. Honeydew can coat branches and objects below the trees, which can subsequently be covered by black sooty mold.
- The majority of sap-sucking insects belong to the orders Hemiptera (true bugs) and Homoptera (aphids, leafhoppers, scales). Common gall formers belong to the insect orders Homoptera (adelgids), Hymenoptera (cynipid gall wasps), and Diptera (gall midges) and to the mite order Acari, which includes gall-forming mites (eriophyid mites) and spider mites.

Figure 1. The boxelder bug is a seed-feeding insect that may overwinter in and around buildings. *Photo: William M. Ciesla, Forest Health Management International, Bugwood.org.*

Figure 2. Pinyon spindle gall. *Photo: Brian Howell, USDA Forest Service.*

Figure 3. Frothy mass covers spittlebug on juniper. *Photo: Whitney Cranshaw, Colorado State University, Bugwood.org.*

Figure 4. The western conifer seed bug may seek overwintering sites around buildings in the fall. *Photo: Whitney Cranshaw, Colorado State University, Bugwood.org.*

Table 1. Common sap-sucking and gall forming insects and mites in the Rocky Mountain Region.

Insect/mite	Host	Symptom
Black pine needle scale[a] (*Nuclaspis californica*)	Ponderosa and Austrian pine	Tiny, black discs on needles
Boxelder bug[a] (fig. 1) (*Leptocoris trivittatus*)	Seeds of boxelder and other maples	Notable home invader in fall
Cooley spruce gall adelgid (*Adelges cooleyi*)	Spruce and Douglas-fir	Galls on spruce; woolly material on Douglas-fir needles and twigs
Eriophyid mites (many species)	Aspen, oak, maples, and others	Areas of deformed foliage, often red or pink-colored
European elm scale (*Gossyparia spuria*)	Elms, primarily American elm	Honeydew, black sooty mold, and scales on branches
Giant conifer aphids(*Cinara* spp.)	Many conifers	Honeydew and aphid colonies
Hackberry budgall psyllid[a] (*Pachypsylla celtidisgemma*)	Hackberry	Enlarged, spherical-shaped killed buds
Hackberry nipplegall maker[a] (*Pachypsylla celtidismamma*)	Hackberry	Nipple-shaped swellings on leaves
Oystershell scale (*Lepidosaphes ulmi*)	Many hardwoods	Grey modeling on bark
Petiole gall aphid (*Pemphigus* spp.)	Aspen, cottonwood, and other poplars	Marble-sized galls on leaf petiole
Pine needle scale (*Chionaspis pinifoliae*)	Pines, spruce, and occasionally other conifers	Tiny, white, teardrop-shaped scales on needles
Pinyon needle scale (*Matsucoccus acalyptus*)	Pinyon pine	Tiny, black, bean-shaped bumps on year-old needles
Pinyon spindle gall midge[a] (*Pinyonia edulicola*) (fig. 2)	Pinyon pine	Football-shaped swelling joining needles with the fascicle
Pitch or Resin midge[a] (*Cecidomyia* spp.)	Ponderosa pine, primarily	Resin pits with many tiny, bright red midge larvae
Spider mites (*Oligonychus* spp., *Tetranychus* spp. and others)	Spruce, junipers, and others	Dried foliage; dusty appearance
Spittlebugs[a] (*Aphrophora* spp.) (fig. 3)	Primarily junipers, oaks, and herbaceous understory plants; also in southwestern dwarf mistletoe	Frothy masses on twigs and foliage
Western conifer seed bug[a] (*Leptoglossus occidentalis*) (fig. 4)	Seeds of pines and Douglas-fir	Damaged seed; can invade homes in the fall

[a] Not discussed in this guide.

- Spider mite injury is usually related to drought conditions.
- Spider mites produce very fine webbing that causes a distinctive dirty appearance due to the accumulation of dust, cast mite skins, and eggs.
- There are many natural enemies that help control sap-sucking insects and mites. Insecticide use can sometimes prolong infestations by killing natural enemies of these insects.
- There are a number of non-native sap-sucking insects that have been introduced to other parts of the country that have become serious forest pests. The central Rocky Mountain Region does not have serious problems with non-native sap-sucking insects in its conifer forests, but several non-native species are found in deciduous landscape trees.
- Sap-sucking insects such as leafhoppers are known to vector certain plant diseases (e.g., X-disease on chokecherry).